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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/636,387	08/09/2000	John R Stuelpnagel	A-67616-2/DJB/RMS/DCF	5553

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EXAMINER
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FORMAN, BETTY J

ART UNIT	PAPER NUMBER
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1634

DATE MAILED: 06/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/636,387	STUELPNAGEL ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	BJ Forman	1634	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 April 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 49-54 and 61-76 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 49-54 and 61-76 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

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## **FINAL ACTION**

### ***Status of the Claims***

1. This action is in response to papers filed 1 April 2004 in which claims 49-52, 61, 63-64, 66, 68 and 72 were amended and claim 76 was added. All of the amendments have been thoroughly reviewed and entered.

The previous rejections in the Office Action dated 11 December 2003 are withdrawn in view of the amendments. The previous objection to the specification is maintained. All of the arguments have been thoroughly reviewed and are discussed below as they apply to the new grounds for rejection. New grounds for rejection, necessitated by amendment, are discussed.

Claims 49-54 and 61-76 are under prosecution.

### ***Specification***

2. The amendment filed 25 June 2001 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: The amendment adds language to the first paragraph of the specification to incorporate by reference parent applications 09/500,555 and 60/119,323. Because the parent applications were not incorporated by reference in the originally filed specification, the amendment constitutes new matter.

Applicant is required to cancel the new matter in the reply to this Office Action.

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**Response to Applicant's Arguments**

3. Applicant argues that the above objection is moot in view of the fact that the difference in priority claimed by Applicants and that proposed by the Office has no effect on any other rejections. The argument has been considered but is not found persuasive. The above objection concerns new matter. The "incorporated by reference" statement added to the first paragraph of the specification introduces new matter into the specification. Applicant is entitled to claim priority to the parent documents based on the priority claim in papers submitted 9 August 2000. However, the priority applications were not incorporated by reference at the time the application was filed. Hence the "incorporated by reference" statement constitutes new matter.

**Applicant is required to cancel the new matter in the reply to this Office Action.**

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 49-54, 61-63, 65-69, 71-74 and 76 are rejected under 35 U.S.C. 103(a) as being unpatentable over Walt et al. (U.S. Patent No. 6,327,410 B1, filed 11 September 1998) in view of Gingeras et al (U.S. Patent No. 6,228,575, filed 7 February 1997) and the definitions Morris ed. (Academic Press Dictionary of Science and Technology, Academic Press, 1992, page 821).

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Regarding Claim 49, Walt et al. teach a method of determining the presence of a target analyte in a sample comprising: acquiring a first data image of a random array composition comprising: a substrate with a surface comprising discrete sites; a population of microspheres comprising at least a first and a second sub-population each comprising a bioactive agent; and a fiducial (i.e. marker bead, Column 19, lines 2-5) wherein said microspheres are randomly distributed on said surface such that said discrete sites contain microspheres; using the fiducial to register said first data image to create a registered first data image; contacting said random array with said sample; acquiring a second data image from said array with said sample; using the fiducial to register said second data image to create a registered second data image; and comparing said first and said second registered data images to determine the presence or absence of said target analyte (Column 18, line 59-Column 19, line 62 and Claims 17-21).

Walt et al teaches an example wherein the array is excited to provide a registered image (Fig. 10A), a sample is added, the array is again excited to provide a second registered image (Fig. 10B). The first and second images are compared to determine the presence of the target analyte (antibody, Column 27, lines 30-54). In this embodiment, Walt does not specifically teach the images are stored in a computer readable memory wherein the computer registers the images by aligning the fiducials prior to comparison of the images.

However, they teach that their fiducials are an important element in identifying beads on the array (Column 19, lines 1-5) which clearly suggests that they utilize the fiducial to create the data image and/or align the images. Therefore, It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to utilize the fiducials of Walt et al to create their images for the expected benefit of identifying beads one-from-another as they desire (Column 19, lines 1-5).

Walt et al further teach the array is decoded using a computer (Column 16, lines 11-15) wherein the computer is used for data analysis (Column 22, lines 8-13) but they do not

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specifically teach their obtained images are stored in a computer readable memory. However, data image storage, comparison and analysis for target analyte determination was well known in the art at the time the claimed invention was made as taught by Gingeras et al (Column 4, line 33-Column, 5, line 67; Column 21, line 59-Column 22, line 21; and Fig. 34). Gingeras et al further teach the substrate comprises fiducials (i.e. control probes) for registering (i.e. orienting) the substrate (Column 16, lines 33-38). Gingeras et al provide the motivation for using their computer image storage i.e. allows one to build up a data base of hybridization patterns corresponding to different species thereby facilitating species (or polymorphism) detection (Column 10, lines 40-67).

It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the computer stored images and comparison utilizing the orientation probes as taught by Gingeras et al to the image analysis of Walt et al for the expected benefit of building a data base of species-specific hybridization patterns thereby facilitating species detection as taught by Gingeras (Column 10, lines 40-67).

Regarding Claim 50, Walt et al teach the method wherein the array comprises a fiber optic bundle and the registration of the first data image utilizes a fiducial fiber (Column 19, lines 2-53).

Regarding Claim 51, Walt et al teach the method wherein the array comprises microspheres and the registration of the first data image utilizes a fiducial microsphere i.e. marker bead (Column 19, lines 2-53).

Regarding Claim 52, Walt et al teach the method wherein the registration utilizes a fiducial template i.e. subarray bundle (Column 18, lines 59-66).

Regarding Claim 53, Walt et al. teach the method wherein the bioactive agents are proteins (Column 7, lines 55-61).

Regarding Claim 54, Walt et al. teach the method wherein the bioactive agents are nucleic acids (Column 7, lines 55-61).

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Regarding Claim 61, Walt et al. teach a method of determining the presence of a target analyte in a sample comprising: providing a first data image of a random array comprising: a substrate with a surface comprising discrete sites; a population of microspheres comprising at least a first and a second sub-population each comprising a bioactive agent; and a fiducial (i.e. marker bead, Column 19, lines 2-5) wherein said microspheres are randomly distributed on said surface such that said discrete sites contain microspheres; contacting said random array with said sample; acquiring a second data image from said array with said sample; using the fiducial to register said second data image to create a registered second data image; and comparing said first and said second registered data images to determine the presence or absence of said target analyte (Column 18, line 59-Column 19, line 62; Example 1; and Claims 17-21).

Walt et al teaches an example wherein the array is excited to provide a registered image (Fig. 10A), a sample is added, the array is again excited to provide a second registered image (Fig. 10B). The first and second images are compared to determine the presence of the target analyte (antibody, Column 27, lines 30-54). In this embodiment, Walt does not specifically teach the images are stored in a computer readable memory wherein the computer registers the images by aligning the fiducials prior to comparison of the images.

However, they teach that their fiducials are an important element in identifying beads on the array (Column 19, lines 1-5) which clearly suggests that they utilize the fiducial to create the data image and/or align the images. Therefore, It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to utilize the fiducials of Walt et al to create their images for the expected benefit of identifying beads one-from-another as they desire (Column 19, lines 1-5).

Walt et al further teach the array is decoded using a computer (Column 16, lines 11-15) wherein the computer is used for data analysis (Column 22, lines 8-13) but they do not specifically teach their obtained images are stored in a computer readable memory. However,

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data image storage, comparison and analysis for target analyte determination was well known in the art at the time the claimed invention was made as taught by Gingeras et al (Column 4, line 33-Column, 5, line 67; Column 21, line 59-Column 22, line 21; and Fig. 34). Gingeras et al further teach the substrate comprises fiducials (i.e. control probes) for registering (i.e. orienting) the substrate (Column 16, lines 33-38). Gingeras et al provide the motivation for using their computer image storage i.e. allows one to build up a data base of hybridization patterns corresponding to different species thereby facilitating species (or polymorphism) detection (Column 10, lines 40-67).

It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the computer stored images and comparison utilizing the orientation probes as taught by Gingeras et al to the image analysis of Walt et al for the expected benefit of building a data base of species-specific hybridization patterns thereby facilitating species detection as taught by Gingeras (Column 10, lines 40-67).

Regarding Claim 62, Walt et al. teach the method of Claim 49 wherein the substrate is selected from the group consisting of glass and plastic i.e. optical fibers (Column 5, lines 57-60) which are comprised of glass or plastic as defined by Morris ed. (page 821).

Regarding Claim 63, Walt et al teach the method wherein the registration utilizes a fiducial edge i.e. subarray bundle (Column 18, lines 59-66).

Regarding Claim 65, Walt et al. teach the method of Claims 53 and 54 wherein the substrate is selected from the group consisting of glass and plastic i.e. optical fibers (Column 5, lines 57-60) which are comprised of glass or plastic as defined by Morris ed. (page 821).

Regarding Claim 66, Walt et al. teach the method of Claims 49 and 62 wherein each sub-population comprises a unique optical signature (Column 13, lines 8-24).

Regarding Claim 67, Walt et al. teach the method wherein the said unique optical signature is a bleed-through signature i.e. the signal is obtained from multiple wavelengths (Column 14, line 17-67).



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Regarding Claim 68, Walt et al. teach the method of Claims 49 and 62 wherein each sub-population comprises an identifier binding ligand that will bind a decoder binding ligand such that the identification of the bioactive agent can be elucidated i.e. enzyme and substrate whereby the enzyme is identified in the presence of the substrate (Column 20, line 51-Column 21, line 6).

Regarding Claim 69, Walt et al teach the array comprises at least three fiducial and each is a fiducial fiber i.e. a unique tag for each of 100 different subarrays (Column 18, line 59-Column 19, line 5).

Regarding Claim 71, Walt et al teach the array wherein the fiducial fibers have a different color i.e. unique tag (Column 18, lines 59-66).

Regarding Claim 72, Walt et al teach the array wherein the registration utilizes at least three fiducial and each of said fiducials is a microsphere i.e. marker beads which identify each of 100 subarrays (Column 18, line 57-column 19, line 5).

Regarding Claim 73, Walt et al teach the fiducials have different sizes (Column 19, lines 6-30).

Regarding Claim 74, Walt et al teach the array wherein the fiducial fibers have a different color i.e. unique tag (Column 18, lines 59-66).

Regarding Claim 76, Walt et al. teach the method of Claims 53 and 54 wherein the substrate is selected from the group consisting of glass and plastic i.e. optical fibers (Column 5, lines 57-60) which are comprised of glass or plastic as defined by Morris et al. (page 821).

### **Response to Arguments**

6. Applicant argues that neither Brenner et al nor Walt et al teach or suggest storing images in a computer memory. The argument has been considered but is deemed moot in view of the amendments adding the stored image limitations, withdrawn rejections and new grounds for rejection.

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7. Claims 64, 70 and 75 are rejected under 35 U.S.C. 103(a) as being unpatentable over Walt et al. (U.S. Patent No. 6,327,410, filed 11 September 1998) in view of Gingeras et al (U.S. Patent No. 6,228,575, filed 7 February 1997) and in view of definitions of Morris ed. (Academic Press Dictionary of Science and Technology, Academic Press, 1992, page 821) as applied to Claims 49 and 61 above and further in view of Augenlicht (U.S. Patent No. 4,981,783, filed 16 April 1986)

Regarding Claim 64, Walt et al and Gingeras et al teach the methods of Claims 49 and 61 as discussed above but Walt does not teach at least a first edge of the array is a fiducial edge. However, Augenlicht teaches a similar method for determining the presence of a target comprising a substrate with a surface comprising discrete sites and at least a first and second population each comprising a bioactive agent distributed on the surface; acquiring a data image to create a registered image and comparing registered images to determine the presence of said target wherein the registered image utilizes a fiducial marking (Column 7, lines 18-46) wherein at least a first edge of the array is a fiducial edge i.e. upper right edge, upper left edge and lower left edge (Fig. 1) and wherein the fiducial markings permit rapid and accurate automated scanning to thereby identify targets rapidly and accurately (Column 8, lines 15-29). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the substrate of Walt et al. by utilizing a fiducial edge as suggested by Augenlicht to thereby reduce operator time and human error by permitting automated scanning of the substrate for the expected benefit of rapid and accurate target analysis as suggested by Augenlicht (Column 8, lines 15-29).

Regarding Claim 70, Walt et al teach the array comprises at least three fiducial and each is a fiducial fiber i.e. a unique tag for each of 100 different subarrays (Column 18, line 59-Column 19, line 5) wherein the fiducials are beads of different sizes (Column 19, lines 6-30) and they further teach that the beads are not uniform, but are instead irregularly shaped

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(Column 7, lines 32-40) which suggest that the bead have different shapes. Furthermore, the skilled practitioner in the art would have been further motivated to modify the different sized fiducial markers of Walt et al by providing at least one fiducial having a different shape to thereby obtain a substrate having fiducials of differing and identifiable shape (e.g. a different identifiable shape in each corner) for the obvious benefit of facilitating identification the target analyte. Because subarrays each having a fiducial of different shape would permit identification of the subarray by simple visual identification of fiducial shape thereby facilitating identification of the subarray and target analyte. Therefore, it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the fiducial beads of Walt et al by encompassing fiducials of different (irregular) shaped into each subarray for the obvious benefits of facilitating target analyte identification.

Regarding Claim 75, the array wherein the registration utilizes at least three fiducial and each of said fiducials is a microsphere i.e. marker beads which identify each of 100 subarrays (Column 18, line 57-column 19, line 5) and they also teach the fiducials are identified by size (Column 19, lines 7-12) and therefore the fiducials are not identified by label which suggests that the fiducials are not labeled. However, Walt et al do not specifically teach unlabeled fiducials. It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the different-sized fiducials of Walt et al by providing unlabeled fiducials of different size based on the suggestion of Walt et al to thereby eliminate the labeling step for the obvious benefit of convenience and economy of time and labor.

### ***Response to Arguments***

8. Applicant argues that Augenlicht does not cure the deficiencies of Walt et al and Brenner et al. The argument has been considered but is not found persuasive because, as stated above, the argument addresses the newly added limitation. Hence, the arguments are moot in view of the amendments, withdrawn rejections and new grounds for rejection.

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9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

#### **Conclusion**

10. No claim is allowed.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BJ Forman whose telephone number is (571) 272-0741. The examiner can normally be reached on 6:00 TO 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached on (571) 272-0782. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to (571) 272-0547.

Patent applicants with problems or questions regarding electronic images that can be viewed in the Patent Application Information Retrieval system (PAIR) can now contact the USPTO's Patent Electronic Business Center (Patent EBC) for assistance. Representatives are available to answer your questions daily from 6 am to midnight (EST). The toll free number is (866) 217-9197. When calling please have your application serial or patent number, the type of document you are having an image problem with, the number of pages and the specific nature of the problem. The Patent Electronic Business Center will notify applicants of the resolution of the problem within 5-7 business days. Applicants can also check PAIR to confirm that the problem has been corrected. The USPTO's Patent Electronic Business Center is a complete service center supporting all patent business on the Internet. The USPTO's PAIR system provides Internet-based access to patent application status and history information. It also enables applicants to view the scanned images of their own application file folder(s) as well as general patent information available to the public.

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BJ Forman, Ph.D.  
Primary Examiner  
Art Unit: 1634  
June 18, 2004